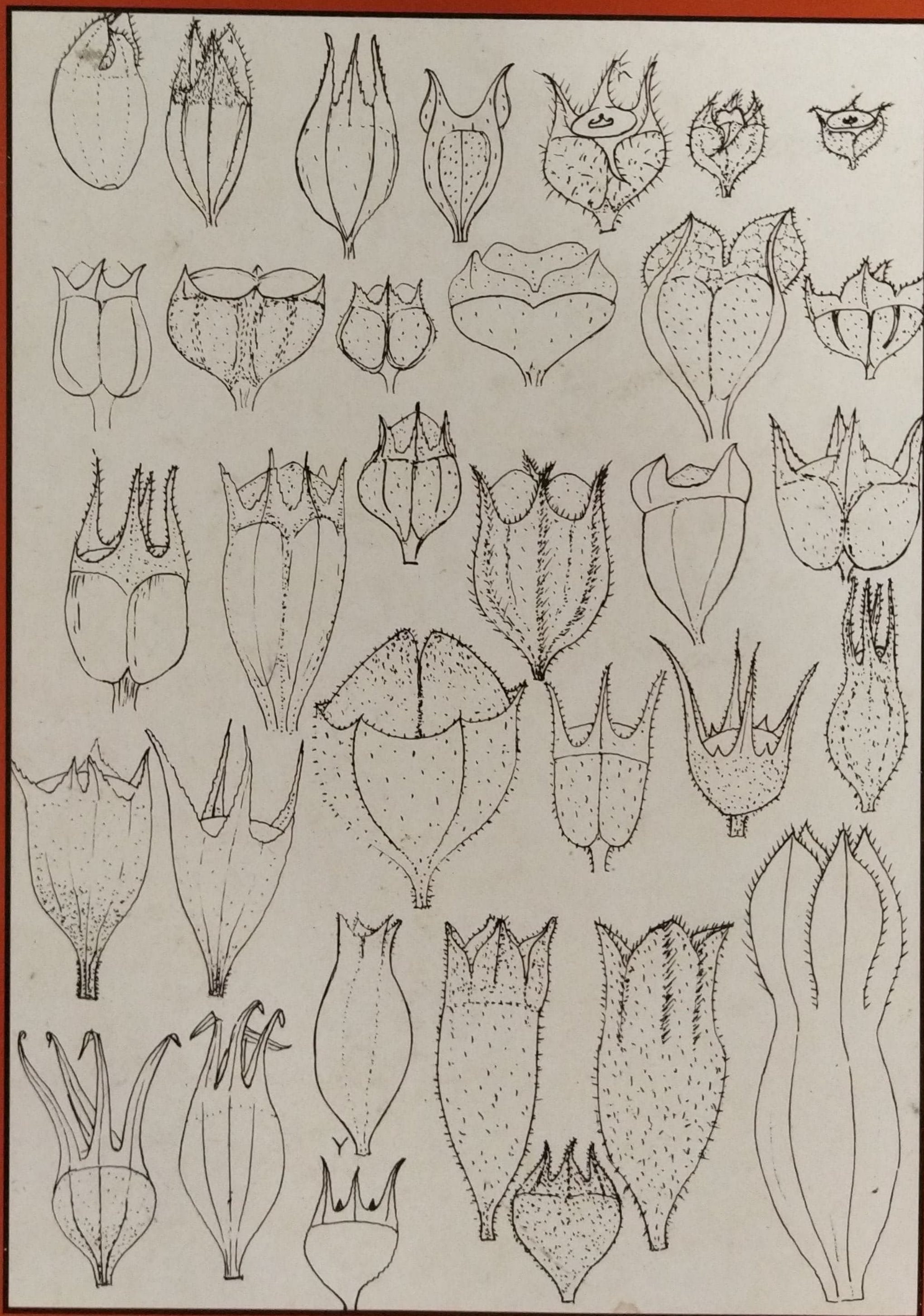
FLORA OF INDIA SERIES : 4

TAXONOMIC REVISION OF HEDYOTIS L. (RUBIACEAE) IN INDIAN SUBCONTINENT

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BOTANICAL SURVEY OF INDIA

KEY TO THE SECTIONS AND SPECIES

(Key is based on division of the genus into sections and similarities among species.)

1a. Capsule dehiscence, septicidal or loculicidal ... 2

1b. Capsule indehiscent, late dehiscent or obscurely or irregularly dehiscent ... 3

2a. Shrubs or herbs; capsule dehiscing septicidally sect. DIPLOPHRAGMA ... 7

2b. Herbs, annual or perennial; capsule dehiscing loculicidally ... 4

3a. Flowers in terminal capitate cyme, partially included within the involucriform bases of upper leaves; capsule membranous, dehiscence irregular sect. INVOLUCRELLA ... 41

3b. Flowers in axillary cymes, rarely terminal capitate; capsule hard, crustaceous, late dehiscent sect. HEDYOTIS ... 42

4a. Calyx teeth erect and distant in fruit ... 5

4b. Calyx teeth erect, recurved, not distant in fruit ... 6

5a. Flowers isostylous or heterostylous; corolla tube not slender, anthers not included in the swollen part of the corolla tube sect. OLDENLANDIA ... 49

5b. Flowers isostylous; corolla tube slender, anthers included in the swollen part of the corolla tube sect. KOHAUTIA ... 66

6a. Inflorescence axillary cymes; capsule ovoid, crustaceous, with converging, erect, rigid calyx teeth sect. SCLEROMITRION ... 71

6b. Inflorescence terminal capitate or subcapitate, pedunculate cymes; capsule globose, narrowly winged, membranous, with lanceolate or ovate-lanceolate recurved calyx-teeth sect. ANOTIDOPSIS ... 74

7a. Shrubs or herbs, erect or decumbent; leaves neither radical nor parallel nerved ... 8

7b. Stoloniferous herbs; leaves radical, parallel nerved ... 1. *H. verticillaris*

8a.	Shrubs erect or climbing or decumbent herbs; peduncles and pedicels usually stout; capsules 2-6 mm long, globose or ellipsoid	... 9
8b.	Herbs annual or perennial from a woody rootstock; peduncles and pedicels capillary; capsules 1-1.5 mm long, globose	... 2. *H. kurzii*
9a.	Capsules enclosed within calyx; shrubs	... 10
9b.	Capsules raised above calyx limb; climbing shrubs	... 11
10a.	Inflorescence terminal or axillary	... 12
10b.	Inflorescence axillary	... 13
11a.	Flowers in terminal and axillary peduncled, paniculate cymes; corolla divided more than half way down; capsules 2-3 mm long	... 14
11b.	Flowers in axillary peduncled umbellate cymes; capsules 4-5 mm long	... 3. *H. trimenii*
12a.	Flowers in simple or capitate cymes	... 15
12b.	Flowers in panicles, corymbose or umbellate cymes	... 16
13a.	Flowers solitary or cymose	... 17
13b.	Flowers in capitate cymes on long slender peduncles	...4. *H. tavoyensis*
14a.	Lateral nerves of leaves obscure; cymes umbellate; capsule top pubscent	... 5. *H. scandens*
14b.	Lateral nerves of leaves prominent; cymes capitate; capsule top glabrous	...6. *H. capitellata*
15a.	Leaves 1-2 cm long; cymes 2-3-flowered in upper axils	... 18
15b.	Leaves 3-13 cm long; cymes capitate, subcapitate or globose heads	... 19
16a.	Branches of inflorescence tri-or dichotomous, rarely whorled; lateral nerves 4-10 pairs	... 20
16b.	Branches of inflorescence whorled; lateral nerves 6-12 pairs, very fine and distinct	... 7. *H. fruticosa*
17a.	Flowers solitary on long pedicels in pair or many in clusters	... 21

17b. Flowers in cymes sessile or peduncled ... 22

18a. Stem corrugated with stipular scars; stipules small, orbicular, white, scarious ... 8. *H. barberi*

18b. Stem not corrugated with stipular scars; stipules sharply toothed ... 9. *H. buxifolia*

19a. Flowers few to many in capitate, subcapitate or subumbellate cymes ... 23

19b. Flowers densely aggregated in globose heads ... 10. *H. uncinella*

20a. Stipules pectinately elongating, with 3-11 bristles ... 24

20b. Stipules triangular, entire, gland-serrated, pectinate or loose sheathing ... 25

21a. Leaves ovate, acute; stipules shortly divided, dense silky pubescent, pedicels 2-4 ... 11. *H. travancorica*

21b. Leaves elliptic, obtuse; stipules deeply divided, hirsute; pedicels 10-20 in fascicles ... 12. *H. villosostipulata*

22a. Cymes sessile or subsessile; flowers densely aggregated... 26

22b. Cymes peduncled, paniculate ... 27

23a. Leaves contracted at base to short, flattened petiole; stipules sheathing ... 28

23b. Leaves subsessile or petiolate, lanceolate or ovate-lanceolate; stipules free, triangular with glandular or viscid margin ... 29

24a. Panicles glabrous; leaves sessile or petiolate, ovate, elliptic or oblong-lanceolate ... 30

24b. Panicles pubescent; leaves sessile, elliptic-ovate, acute ... 13. *H. swertioides*

25a. Stipules small, triangular or ovate-lanceolate, entire or pectinate ... 31

25b. Stipules large, loose sheathing ... 14. *H. lessertiana*

26a. Flowers sessile to shortly pedicelled; stipules triangular, pectinate, usually sheathing ... 32

26b. Flowers slender pedicelled; stipules triangular, pectinate, with recurvd teeth ... 15. *H. ramarowii*

27a. Stipules glabrous; peduncles short; calyx lobes lanceolate, much longer than capsules ... 16. *H. albonervia*

27b. Stipules hirsute; peduncles long, slender; calyx lobes ovate-lanceolate, equalling hirsute capsules ... 17. *H. hirsutissima*

28a. Stipules large, forming loose sheath, becoming white in age ... 33

28b. Stipules broad, sheathing, with 6-7 ciliate bristles; leaves orbicular, 6-7 nerved ... 18. *H. beddomei*

29a. Leaves petioled, 10-13.5 cm long, ovate or elliptic-lanceolate, glabrous, acuminate at apex ... 19. *H. gamblei*

29b. Leaves subsessile or short petioled, 3-4 cm long, lanceolate, acute, scabrid above along the nerves beneath ... 20. *H. griffithii*

30a. Stipules with 7-11 bristles, pubescent; panicles with short rhachis ... 34

30b. Stipules with 3-5 bristles; panicles with elongating rhachis, mostly pendulous ... 21. *H. eualata*

31a. Capsules 2-6 mm long, globose or ellipsoid; leaves with 4-10 pairs of lateral nerves ... 35

31b. Capsules 1-1.5 mm long, globose; leaves with obscure lateral nerves ... 22. *H. acutangula*

32a. Stem, leaves, inflorescence glabrous or puberulous ... 36

32b. Stem, leaves, inflorescence pilose hairy ... 23. *H. nodulosa*

33a. Leaves elliptic, with prominent midrib ciliate along margin ... 24. *H. flavescens*

33b. Leaves orbicular, glabrous, recurved at margin; lateral nerves 5 arising from the base ... 25. *H. quinquenervia*

34a. Branches of the inflorescence trichotomous; corolla tube slender, much longer than the calyx lobes ... 26. *H. leschenaultiana*

34b. Branches of the inflorescence whorled; corolla tube nearly as long as the calyx lobes ... 27. *H. devicolamensis*

35a. Calyx lobes not elongating in fruit ... 37

35b. Calyx lobes elongating in fruit ... 28. *H. purpurascens*

36a. Stem acutely angular to winged; calyx lobes nearly as long as capsules ... 29. *H. tetrandra*

36b. Stem obtusely angular; calyx lobes much longer than capsules ... 30. *H. membranacea*

37a. Stipules triangular or ovate-lanceolate, acuminate, gland-toothed or gland-serrated ... 38

37b. Stipules pectinate with short or long, subulate segments ... 39

38a. Leaves subsessile, lanceolate; lateral nerves very obscure ... 31. *H. srilankensis*

38b. Leaves petioled, ovate, acuminate; lateral nerves not obscure. ... 32. *H. viscida*

39a. Cymes spreading, many-flowered, pruinose or pubescent ... 40

39b. Cymes short; flowers crowded, glabrous ... 33. *H. articularis*

40a. Cymes pruinose; capsules 2-3 mm long, globose or subglobose, pruinose ... 34. *H. pruinosa*

40b. Cymes pubescent; capsules 5-6 mm long, ellipsoid, pubescent ... 35. *H. bourdillonii*

41a. Flowers subsessile or pedicelled, 3-5 mm long ... 42

41b. Flowers subsessile, 15-18 mm long ... 36. *H. merguensis*

42a. Leaves mostly plaited longitudinally; cymes axillary ... 43

42b. Leaves mostly plaited longitudinally; cymes terminal capitate with involucral leaves at base ... 37. *H. scabra*

43a. Herbs; capsule globose, usually broader at base; calyx lobes ovate, acute or narrrowly triangular-lanceolate ... 44

43b.	Shrubs; capsule ovoid, cuneate at base, glabrous; calyx lobes broadly triangular-lanceolate	... 38. *H. congesta*
44a.	Cymes peduncled; few- flowered	... 45
44b.	Cymes sessile or subpeduncled, many-flowered	... 46
45a.	Flowers pedicelled, loosely arranged in pedunculate cymes	... 47
45b.	Flowers sessile or shortly pedicelled, crowded in trichotomously branched pedunculate cymes	... 48
46a.	Leaves oblong-lanceolate, nerves faint; stipules with rigid bristles	... 39. *H. paradoxa*
46b.	Leaves ovate-lanceolate, nerves prominent; stipules with slender awn-like cilia	... 40. *H. auricularia*
47a.	Leaves lanceolate, acuminate, glabrous; calyx lobes much shorter than glabrous fruit	... 41. *H. insularis*
47b.	Leaves elliptic-lanceolate, pubescent; calyx lobes much longer than pubescent fruit	... 42. *H. lineata*
48a.	Flowers 2-3 mm long, sessile or subsessile; capsule less than 1 mm long, with spreading calyx lobes	... 43. *H. vestita*
48b.	Flowers 3-4 mm long, shortly pedicelled; capsule more than 1 mm long, with converging calyx lobes	... 44. *H. fulva*
49a.	Leaves less than 1 cm broad, linear to narrowly elliptic, lanceolate or orbicular; capsule terete with narrowly triangular calyx teeth	... 50
49b.	Leaves more than 1 cm broad, elliptic-oblong or ovate-oblong, obtuse or rounded; capsule 4 angular with broadly triangular calyx teeth	... 51
50a.	Flowers usually axillary, solitary or 2-5 in corymb or several in umbel	... 52
50b.	Flowers in terminal and axillary panicles	... 53
51a.	Inflorescence not loose corymbose cyme; stamens and styles both inserted; capsule ovoid or ellipsoid, angular to winged; testa deeply pitted	... 54
51b.	Inflorescence terminal loose corymbose panicles, stamens and style both exserted; capsule ovoid, obtusely angular; testa smooth, reticulate	... 45. *H. ovatifolia*

52a. Flowers isostylous; stamens and style inserted or exserted ... 55

52b. Flowers heterostylous, sessile or shortly pedicelled in trichotomously branched umbellate cyme ... 46. *H. puberula*

53a. Flowers in terminal or axillary laxly dichasial cymes, isostylous or heterostylous ... 56

53b. Flowers in terminal, 2-4 flowered cymes or axillary, solitary, isostylous; stamens and style both exserted ... 57

54a. Inflorescence subcapitate or paniculate cyme; capsule ellipsoid, narrowly to broadly 4-winged; calyx teeth longer than hemispheric crown ... 58

54b. Inflorescence racemose cymes; capsule ovoid, 4-ribbed; calyx teeth shorter than the hemispheric crown ... 47. *H. racemosa*

55a. Peduncle 2-8 flowered cyme or flower solitary ... 59

55b. Peduncle solitary or in pair, 1-flowered; capsule globose, rounded with conical top ... 48. *H. herbacea*

56a. Flowers isostylous or heterostylous; capsule globose, usually broader than long ... 60

56b. Flowers isostylous; stamens and styles both exserted; capsule obovoid or ellipsoid, twice as long as broad ... 49. *H. graminifolia*

57a. Corolla tubular; calyx lobes much shorter than the corolla tube, accessory calyx teeth absent ... 61

57b. Corolla campanulate; calyx lobes as long as or longer than corolla, accessory calyx teeth present ... 50. *H. stocksii*

58a. Inflorescence subcapitate cyme; calyx teeth broadly triangular; capsule 4-winged ... 51. *H. pterita*

58b. Inflorescence paniculate cyme; calyx teeth triangular-lanceolate; capsule narrowly 4-winged ... 52. *H. hermanniana*

59a. Leaves orbicular; flowers sessile, solitary or clustered; capsule globose, didymous ... 53. *H. trinervia*

59b. Leaves linear or narrowly elliptic; flowers pedicelled, solitary or in pedunculate cyme; capsule globose or ellipsoid ... 62

60a. Flowers heterostylous; corolla funnel-shaped; capsule globose ... 54. *H. affinis*

60b. Flowers isostylous; corolla short tubular; capsule globose, much broader than long ... 55. *H. attenuata*

61a. Leaves less than 5 mm broad, linear or triangular-lanceolate; stem rigid, terete or angular ... 63

61b. Leaves more than 5 mm broad, elliptic, acute; stem delicate, angular and winged ... 56. *H. hygrophilla*

62a. Leaves linear-lanceolate or elliptic-lanceolate; calyx teeth narrowly triangular, distant in fruit; flower solitary or 2-8 in peduncled cymes ... 64

62b. Leaves narrowly elliptic; calyx teeth triangular, close in fruit; peduncle usually 2-flowered ... 57. *H. pumila*

63a. Capsule 1.5-2 mm broad, globose; peduncle and pedicel not stout ... 65

63b. Capsule 3-3.5 mm broad, roundish, widening upward from base; peduncle and pedicel stout ... 58. *H. diffusa*

64a. Flowers in corymbs or 2-3 in cymes; stamens and style inserted; capsule ovoid, crown truncate above ... 59. *H. corymbosa*

64b. Flowers 2-4 in cymes; stamens and style exserted; capsule globose or subglobose, narrowed below the calyx-teeth, crown hemispheric ... 60. *H. pseudocorymbosa*

65a. Stem terete, setaceous; leaves triangular-lanceolate, hispid ... 61. *H. linoides*

65b. Stem angular, ridges scabrid; leaves linear-lanceolate, glabrous ... 62. *H. graminicola*

66a. Style ending in 2 filiform stigma lobes; flowers glabrous outside; corolla tube much longer than calyx lobe ... 67

66b. Style ending in an unlobed, ovoid or cylindrical stigma; flowers scabrid outside; corolla tube slightly longer than calyx lobe ... 63. *H. coccinea*

67a. Corolla tube 2-5 times longer than the lobe; style long; stigma just below the anther ... 68

67b. Corolla tube 5-6 times longer than the lobe; style long; stigma just below the anther ... 64. *H. retrorsa*

68a. Corolla tube 4-5 times longer than the corolla lobe; capsule globose ... 69

68b. Corolla tube twice the corolla-lobe; capsule ellipsoid or oblong-ellipsoid ... 65. *H. gracilis*

69a. Leaves whorled; flowers sessile or short pedicelled; capsule scabrid ... 66 *H. aspera*

69b. Leaves opposite; flowers with capillary pedicel; capsule minutely scabrid ... 67. *H. nagporensis*

70a. Leaves narrowly lanceolate to elliptic lanceolate, 0.5-0.7 cm broad ... 71

70b. Leaves linear, 0.2-0.3 cm broad ... 72

71a. Stem robust; leaves elliptic-lanceolate; flowers 4-6 at an axil; corolla tube glabrous ... 73

71b. Stem wiry; leaves elliptic-lanceolate; flowers 2-4 at an axil; corolla tube with a ring of hairs inside ... 68. *H. angustifolia*

72a. Stiff herbs, stem terete, setaceous; leaves aristate at apex ... 69. *H. cyanantha* (=S caeruleum)

72b. Slender diffuse herbs, stem angular or winged, laxly hispid; leaves acuminate at apex ... 70. *H. pinifolia*

73a. Leaves hispid on both the surfaces; capsule globose, hispid ... 71. *H. verticillata*.

73b. Leaves glabrous, glossy on lower surface; capsule ovoid, glabrous ... 72. *H. neesiana*

74a. Leaves elliptic-lanceolate, acuminate; inflorescence terminal capitate cyme, dense flowered, accessory calyx teeth present ... 73. *H. brunonis*

74b. Leaves ovate-oblong, obtuse; inflorescence terminal or axillary subcapitate or less flowered cyme, accessory calyx teeth absent ... 74. *H. andamanica*